

and 11th, in rear of the preceding area, and passed northeastward over the Black Sea on the 13th. *South Atlantic Ocean*.—February 7th, 1879, 50° 02' S., 57° 41' W., barometer 29.18, W. by N. fresh gale, rough sea, cloudy; 27th, 47° 32' S., 62° 19' W., barometer 29.19, SSW. fresh gale, rough sea, cloudy. *North Pacific Ocean*.—Three well developed depressions appeared during the latter part of February and first half of March on the east coast of Asia, and the tracks Nos. I, II and III, indicate their general directions, although reports are too meagre to allow them to be considered as anything more than approximations. No. I passed eastward at a short distance north of Zi-Ka-Wei, China, on February 27th; at this place the lowest barometer (29.73) occurred at 2 p. m., and the wind veered from SE. by S. and W. to NW.; total rain-fall 1.39 inches. Nos. II and III probably moved in the directions shown, although there is no data yet to hand to mark the exact positions of their centres. *South Pacific Ocean*.—"January 9th and 10th, 1879, between Feejee Islands and New Hebrides, hurricane with heavy seas." Ship "Othello" reports February 8th, 17° 40' S., 172° E., severe NW. gale increasing at 10 p. m. to hurricane; 9th, 5 a. m., hurricane at its height, wind terrible,—8 a. m., moderated, fearful sea, wind SW.,—noon, moderate but sea very high—4 a. m., (probably should be p. m.,) another gale more violent than before, wind NNE., with thunder and lightning—later, wind S. and high confused sea; 10th, SW. heavy gale, moderating during afternoon." *Indian Ocean*.—"January 20th, 1879, 16° S., 100° E., decks filled with water during heavy SE. gales."

TEMPERATURE OF THE AIR.

The isothermal lines on chart No. II show the general distribution of the temperature of the air for the month. By a reference to the table of average temperatures upon the same chart it will be seen that for the present month it averages below that for a number of years at Yuma and Tucson, Arizona, in Eastern Gulf States, Florida, Atlantic States, Lower Lake region, St. Lawrence valley and on Mt. Washington. For the remaining districts it has averaged higher than usual, especially from Utah and Northern Arizona northeastward to the Upper Mississippi valley.

Minimum and Maximum Temperatures, respectively, are for *Maine*—at Orono, 14° and 64°; Eastport, 16°, 55°; Portland, 23°, 62°. *New Hampshire*—Mount Washington, -7°, 42°; Dunbarton, 18°, 73°. *Vermont*—Newport, 11°, 62°; West Charlotte, 18°, 72°; Burlington, 13°, 68°. *Massachusetts*—Rowe, 14°, 60°; Billerica, 22°, 79°; Boston, 19°, 70°. *Rhode Island*—Fort Adams, 21°, 70°; Newport, 22°, 67°. *Connecticut*—Southington, 19°, 71°; Mystic, 25°, 72°; New Haven, 22°, 71°. *New York*—Madison barracks, 9°, 70°; West Point, 17°, 80°; Plattsburg barracks, 11°, 64°; Albany, 17°, 69°; New York city, 24°, 72°; Rochester, 11°, 75°; Buffalo, 15°, 71°. *New Jersey*—Princeton, 19°, 81°; Vineland, 30°, 83°; Atco, 29°, 84°. *Pennsylvania*—Franklin, 12°, 76°; New Castle, 26°, 84°; Philadelphia, 25°, 80°; Pittsburgh, 23°, 82°; Litchfield, 15°, 73°; Catawissa, 23°, 81°. *Delaware*—Dover, 32°, 80°. *Maryland*—Woodstock, 22°, 81°; Emmitsburg, 22°, 83°; Baltimore, 29°, 83°. *District of Columbia*—Washington, 27°, 85°. *Virginia*—Wytheville, 22°, 79°; Accotink, 30°, 87°; Norfolk, 28°, 86°. *West Virginia*—Helvetia, 22°, 80°; Wellsburg, 26°, 88°; Morgantown, 22°, 82°. *North Carolina*—Highlands, 20°, 72°; Weldon, 34°, 88°; Greensboro, 32°, 80°. *South Carolina*—Aiken, 35°, 85°; Charleston, 39°, 81°. *Georgia*—Forsyth, 34°, 84°; Quitman, 36°, 86°; Augusta, 34°, 85°. *Florida*—Milton, 24°, 76°; Houston, 32°, 92°; Jacksonville, 39°, 88°. *Alabama*—Green Springs, 30°, 81°; Montgomery, 36°, 87°; Mobile, 40°, 86°. *Mississippi*—Brook Haven, 36°, 79°; Fayette, 38°, 82°; Vicksburg, 39°, 83°. *Louisiana*—Okalooska, 36°, 85°; Shreveport, 44°, 85°; New Orleans, 46°, 85°. *Texas*—Concho, 35°, 97°; Eagle Pass, 46°, 100°; Denison, 40°, 85°; Austin, 50°, 85°; Uvalde, 37°, 98°; Galveston, 56°, 82°; Corsicana, 37°, 87°; Indianola, 52°, 89°; El Paso, 31°, 98°. *Ohio*—North Lewisburg, 14°, 81°; Jacksonburg, 19°, 90°; Columbus, 18°, 82°; Cincinnati, 23°, 82°. *Kentucky*—Bowling Green, 28°, 85°; Louisville, 26°, 84°. *Tennessee*—Knoxville, 24°, 87°; Memphis, 36°, 85°; Austin, 32°, 84°. *Arkansas*—Mt. Ida, 28°, 82°. *Michigan*—Alpena, 5°, 66°; Marquette, 12°, 80°; Nirvana, 19°, 87°; Detroit, 21°, 76°. *Indiana*—New Corydon, 16°, 81°; St. Meinrad, 27°, 85°; Indianapolis, 21°, 82°. *Illinois*—Riley, 8°, 84°; Sterling, 22°, 88°; Chicago, 17°, 80°; Cairo, 29°, 83°. *Missouri*—Pierce City, 14°, 87°; Kansas City, 14°, 89°; St. Louis, 25°, 83°. *Kansas*—Topeka, 10°, 86°; Independence, 26°, 90°; Dodge City, 19°, 87°. *Iowa*—Logan, 12°, 78°; Guttenburg, 18°, 88°; Des Moines, 17°, 84°. *Nebraska*—Plattsmouth, 12°, 80°; Fort McPherson, 14°, 85°; Fort Hartsuff, 9°, 81°. *Indian Territory*—Fort Sill and Fort Gibson, 31°, 84°. *Minnesota*—Duluth, 7°, 69°; Breckenridge, 4°, 77°; St. Paul, 13°, 81°. *Dakota*—Olivet, 9°, 82°; Deadwood, 20°, 71°; Bismarck, 11°, 75°; Pembina, -10°, 75°; Yankton, 7°, 80°; Morrystown, 20°, 82°. *Colorado*—Pike's Peak, -10°, 37°; Ft. Lyon, 25°, 84°; Denver, 28°, 76°; Ft. Garland, 15°, 74°; Colorado Springs, 24°, 71°. *New Mexico*—Ft. Union, 21°, 80°; Santa Fé, 23°, 84°. *Wyoming Territory*—Cheyenne, 22°, 72°; Ft. Fred. Steele, 17°, 76°. *Utah*—Promontory, 25°, 78°; Ogden, 36°, 83°; Ft. Douglass, 28°, 70°; Salt Lake City, 30°, 74°. *Nevada*—Tecoma, 16°, 80°; Winnemucca, 26°, 77°; Pioche, 26°, 90°; Camp Halleck, 29°, 83°. *Arizona*—Yuma, 48°, 103°; Tucson, 39°, 97°. *Idaho*—Boise City, 32°, 80°. *Montana*—Virginia City, 18°, 66°. *California*—San Francisco, 46°, 76°; Los Angeles, 42°, 88°; Summit, 20°, 55°; Red Bluff, 40°, 87°; Visalia, 40°, 89°; Campo, 26°, 90°; Indio, 50°, 109°; Mammoth Tank, 52°, 108°. *Oregon*—Portland, 35°, 77°; Roseburg, 32°, 75°. *Washington Territory*—Olympia, 32°, 64°.

Ranges of Temperature.—The monthly ranges will appear from an examination of the minimum and maximum just given. Greatest daily ranges vary in New England from 18° at Wood's Holl and summit of Mt. Washington to 34° at Springfield; Middle Atlantic States, 25° at New York City to 43° at Lynchburg; South Atlantic States, 21° at Cape Lookout to 35° at Augusta; Eastern Gulf States, 15° at Key West to

34° at Montgomery; West Gulf States, 19° at Galveston to 47° at Uvalde, Tex.; Ohio valley and Tennessee 31° at Cairo to 38° at Memphis; Lower Lake region, 23° at Oswego to 35° at Buffalo; Upper Lake region, 25° at Chicago to 39° at Marquette; Upper Mississippi valley, 28° at Keokuk to 39° at St. Paul; Missouri valley, 33° at Omaha to 47° at Yankton; Red River of the North, 38° at Pembina to 43° at Breckenridge; Eastern Rocky Mountain slope, 36° at Deadwood and 39° at Fort Sill to 50° at North Platte; Rocky mountains, 17° on Pike's Peak and 31° at Virginia City to 45° at Cheyenne; Western Plateau, 32° at Pioche to 40° at Winnemucca and Boise City; California, 24° at San Francisco to 56° at Campo; Arizona, 55° at Yuma to 58° at Tucson; Oregon, 29° at Portland and 31° at Roseburg; Washington Territory, 27° at Olympia.

Frost, injurious to vegetation, is reported as follows: Green Springs, Ala., 5th, peaches killed, and the foliage of many trees frost bitten. A report, dated the 18th, gives the following information: Burke Co., Ga., peaches nearly all killed; Talbot Co., Ga., peaches one-half killed; Sumter Co., Ga., fruit materially injured; Montezuma Co., Ga., crops not materially damaged by late frost; Rockdale Co., Ga., young corn killed; Thomas Co., Ga., corn injured; Valdesta Co., Ga., considerable damage to cotton and other vegetables. Houston, Fla., 5th, great damage to vegetables and early cotton; Mayport, Fla., 5th, 6th, vegetation considerably injured; Gulf Hammock, Fla., 5th, 6th, cotton so severely damaged that it had to be replanted; corn and sugar cane damaged somewhat; Thomasville, Ga., 5th, vegetation considerably damaged; Peoria, Ill., 3rd, many flowers killed; Independence, Kan., 2nd, 3rd, 4th, peaches all killed; Creswell, Kan., 18th, fruit badly injured; Lenoir, N. C., 9th, peaches killed; Aiken, S. C., 4th, 5th, fruit injured, pea blossoms and leaves of trees killed; McMinnville, Tenn., 3rd, 4th, 5th, early fruit considerably injured; Boise City, Idaho, 26th, all kinds of fruit frost-bitten; St. Marks, Fla., 6th, considerable injury to corn, cotton and tender vegetation; Mobile, Ala., 5th, potatoes and beans severely injured; Knoxville, Tenn., all fruits supposed to be killed in this vicinity; Cairo, Ill., peaches reported entirely destroyed; Nashville, Tenn., 4th, peaches killed; Chattanooga, Tenn., 5th, fruit injured; Charlotte, N. C., 4th, 5th, vegetables and fruit all destroyed, wheat and oats badly damaged; Wilmington, N. C., 4th, great damage to early vegetables and fruit; Augusta, Ga., 4th, fruit and vegetables seriously injured; Lynchburg, Va., 4th, fruit slightly injured; Yreka, Cal., 7th, 20th, heavy frost, peaches killed; Great Bend, Kan., 3rd, peaches damaged.

Frost out of Ground.—Muscatine, Ia., 1st; Monticello, Ia., 1st; Waltham, Mass., 16th; Contoocookville, N. H., 15th; Hector, N. Y., 14th.

Ice formed at Salt Lake City on the 9th; Santa Fe, N. M., 9th, 10th, 13th, 23rd, and in the Southern States as follows: Forsyth, Ga., 4th, 5th; Weldon, N. C., 4th, 13th; Wilmington, N. C., 4th; Statesville, N. C., 4th; McMinnville, Tenn., 3rd, 4th, 5th; Cairo, Ill., 3rd, 4th, 5th; Charlotte, N. C., 4th, 5th; Cape Lookout, N. C., 4th; Augusta, Ga., 4th; Green Springs, Ala., 3rd, 4th, 5th, 6th; Gulf Hammock, Fla., 5th; Palermo, N. Y., 4th, ice on pond 16 inches thick; Strafford, Vt., 29th, streams clear of ice; Dunbarton, N. H., 30th, ice still on ponds; Rowe, Mass., 30th, ice completely covers a reservoir pond except about the edges where streams flow in, although it is fully open to the sun; it is said to be very rare for it to be found clear of ice before May 1st.

Ground Frozen.—Atco, N. J., 20th; Palermo, N. Y., 4th; Egypt, Pa., 18th; Chambersburg, Pa., 12th; Mt. Solon, Va., 3rd; Neillsville, Wis., 2nd, from 3½ to 5 feet deep.

PRECIPITATION.

The general distribution of the rain-fall, which includes melted snow, for the month is illustrated as accurately as possible upon chart No. III. In the lower left-hand corner of same will be found a table giving the average precipitation of *April* by districts. In New England, the South Atlantic and Gulf States it has been larger than usual. Along the California coast an average fall has taken place. In the remaining districts there has been a deficiency.

Special Heavy Rains.—13th and 14th, Okalooska, La., 3.20 in. 14th and 15th, Mobile, Ala., 3.33 in.; Fort Barrancas, Fla., 5.40 in.; St. Marks, 5.15 in. 15th, Shreveport, 4.64 in. in 8 hours. 15th and 16th, Brook Haven, Miss., 3.15 in. 15th to 17th, Thomasville, Ga., 5.54 in. 16th, Okalooska, La., 2.60 in.; New Orleans, 2.82; Aiken, S. C., 3.60 in.; Montgomery, Ala., 2.52. 16th and 17th, Savannah, Ga., 6.11; Charleston, S. C., 5.09; Wilmington, N. C., 2.61 in.; Forsyth, Ga., 3.65 in.; Quitman, Ga., 3.90; Fayetteville, N. C., 3.00 in. 16th to 18th, Fort Barrancas, Fla., 4.08 in. 21st and 22nd, Wellington, Kan., 3.13 in.; Ft. Sill, Ind. Ty., 6.46 in.; Graham, Tex., 3.68 in., (supposed total about 4.03 in.) 21st to 23rd, Hat Creek, Wy., 6.74 in. 22nd, Corsicana, Tex., 6.31 in. (in 4 hours); Melissa, Tex., 4.00 in. 22nd and 23rd, Clarksville, Tex., 5.50 in.; Austin, Tex., 4.40 in. 23rd, Corsicana, Tex., 3.31 in. 23rd and 24th, New Ulm, Tex., 5.12 in. 25th and 26th, New Orleans, 4.27 in. 27th and 28th, Fayetteville, N. C., 6.25 in.; Pilot Point, Tex., 3.00 inches in 45 minutes.

Largest Monthly Rain-falls.—Ft. Barrancas, Fla., 14.28 inches; Fayetteville, N. C., 12.75; Pikes Peak, 12.15; Corsicana, 11.50; Shreveport, 10.23; St. Marks, 9.73; New Orleans, 9.17; Okalooska, La., 8.86; Savannah, 8.69; Clarksville, Tex., 8.37; Quitman, Ga., 8.00; Alta, Cal., 7.73; Deadwood, Dak., 7.69; Fort Sill, Ind. Ty., 6.93; Mt. Washington, 6.79; Colfax, Cal., 6.56; Mobile, 6.42.

Smallest Monthly Rain-falls.—Indio, Mammoth Tank and Yuma, Cal., Burkes, Ariz., and Edinburg, Tex., none; Tucson, Ariz., and Albuquerque, N. M., 0.02 inches; Prescott, Ariz., and La Mesilla, N. M.